

## IMPROVING THE OLD.

CONTRARIETY IN INVENTION AND  
HOW THE RULE WORKS.

The Irreverent Inventor Seeks Not to Find  
a New Way of Doing a Thing—Sometimes  
He Finds to Find a Better Way, Often He  
Stumbles Upon a Great Idea.

There is apt to be a fine irreverence about the inventor which leads him to suspect that any old way of doing a thing is for that very reason not the best way. Often he observes some time honored plan of working, audaciously makes up his mind to do the exact opposite and hits upon success. Guns were loaded at the muzzle for ages, until one day a man of originality thought of loading them at the other end, the preferable end on many accounts besides that of manifest convenience. The same path was trodden by the Frenchman who first put the eye of a needle near its point instead of away from its point. He little knew that he was doing a great deal to make the sewing machine a possibility.

One of the notions of the pioneer railway engineers in England was that their rails must be flanged so that the wheels of locomotives and carriages should not get off the track. But some one of skeptical mind inquired, "Why not leave the top of the rail flat, or nearly flat, and put the flange on the wheel, an easier thing to do?" Accordingly the flange was taken from the rail to the wheel and remains there to this day to remind the traveler that an eastern philosopher said long ago, "To him that is well shod it is as if the whole earth were covered with leather."

It is a good many years now since steam was first used for heating buildings, and as air when warmed ascends what more natural than that steam coils should hug the floors just as the stoves before them had done? But in some of the largest factories in this country the coils are fastened not to the floor, but to the ceiling, which proves to be a better place for them. As everybody knows who ever sat before an open fire, radiation is a pleasant means of warmth than convection, than heat carried along by currents of air. Floor space is incidentally saved, and the risk of gathering combustible rubbish about the coils is avoided.

In the ages of simplicity, which came down to Watt's time and the invention of the steam engine, when a kettle was to be heated the proper place for the fire was thought to be outside. But when big boilers came in, with pressing need that their contents be heated in the shortest time possible, it was found gainful to put the fire inside. Stephenson's locomotive, the Rocket, derived no small part of its efficiency from his knowledge to which side of the boiler to apply flame.

On somewhat the same principle Lord Dundonald, one of the early improvers of the steam engine, forced the hot air currents under his boiler from above downward, against their natural tendency to move from below upward. In this way he made available much heat that otherwise would have been wasted. The steam engine, whether mounted on wheels or not, always keeps its fuel outside—furnace and cylinder are distinct. Today the steam engine's primacy is challenged by a motor which uses its fuel inside, the furnace being no other than the cylinder, precisely as in the barrel of a gun. So much more work does a gas engine yield than a steam engine, in comparison with the heat applied, that only the denseness of heat as supplied by gas prevents the speedy supercedure of steam for motive power. As gas engines grow steadily larger, their margin of economy becomes so decided that it begins to pay to make gas on purpose to burn in them.

In the reduction of bauxite, the refractory ore of aluminium, it is necessary to maintain an extreme temperature. The melting point of the mineral is high, and only so much of the heat as ranges above that temperature does work. In the mining department of the World's fair is an exhibit showing how the modern metallurgist reduces aluminium with new economy. Instead of employing the old crucible method and applying the fire from without, he incloses the ore in a nonconducting bed, and by means of a powerful electric current applies the heat from within. Electric furnaces of this type now produce bronze and other alloys at prices which steadily fall as their market enlarges.

Not far from the mining exhibit at Chicago stands Machinery hall. When its visitors see one of the largest steam engines driving machinery with a slack belt, they are wont to express surprise. Ordinary folks today think just what mechanists thought a few years ago—that tightness is the effective and indeed the only feasible condition for belts. But in this case, as in a good many others, the rule of contraries has come, and with profit.

Architects as well as engineers and metallurgists have found it profitable to go into opposition where some ancient practice has been concerned. In latitudes of much fall of rain or snow the form of roof which most obviously suggests itself is the common pitched roof, resembling an A more or less broadened. Vexed by bursting rain conductors, by impromptu object lessons as to the force of avalanches, northern architects take not A, but V, duly widened, for their roof type. In winter ice and snow, caught as in a basin, cannot fall to the street. Icicles are banished, and in conductors carried through the heart of the building and kept warm by the building ice is gradually melted without a chance to do damage.—New York Sun.

Signing With the Cross.  
Signing with the cross was first practiced by Christians to distinguish them-

seives from the pagans. In ancient times kings and nobles used the sign of the cross, whether they could write or not, as a symbol that the person making it pledged himself by his Christian faith to the truth of the matter to which he affixed it.—Detroit Free Press.

### A Cat That Is Bound to Live.

When he wandered into our boarding house on Lackawanna avenue, he was a nice little tomcat with eyes as innocent as a child's. He used to stand on his hind legs and cry for milk, and as long as he conducted himself he was treated well. He, however, became thievish and insufferably lazy. He used to purloin the choicest beefsteaks, take them down to the cellar and devour them. He used also to get in the way of the girls, who were generally in a hurry at mealtime, and the help became thoroughly sick and tired of him.

One day the dishwasher hung him out of the fourth story back window. He didn't seem to mind it in the least though. He alighted on his paws, and looking up at the girl he winked his right eye, as much as to say, "No, you don't," and then walked leisurely round to the front of the house and came into the kitchen again in all his philosophic calm and just as though nothing unusual had happened.

The next day Thomas was tied up in a bag and deposited somewhere in the wilds near Taylor, but, lo and behold, he returned about three weeks afterward at 8 o'clock in the morning to his old home and woke up the whole block with his piteous appeals for food and shelter. He was given both. It was thought that he might possibly reform, but he didn't. He became still more thievish and lazy.

Then it was determined that he should die by poison. A nice juicy piece of beef was sprinkled with strychnine, and he was locked up in a closet with it for four days. Everybody thought he would be dead sure when the closet was opened, but he wasn't. He just simply paraded and clawed the floor for joy when he was released. He had sense enough not to touch the poisoned meat at all. Finally he was locked down in the bottom cellar, the third from the surface of the street, and when seen a few days ago he was as fat and sleek and comfortable as any cat in the city of Scranton. He is living on rats, and the diet seems to agree with him.—Scranton Truth.

### Diagnosing an Illness.

It would seem to be simple enough to attribute the fever which ordinarily follows the fracture of a leg to the irritation which is set up in the limb by the accident, yet, in point of fact, that fever is not seldom the result of the sympathetic disturbance of nerve centers, as, for example, those of the stomach, and in treating it it becomes necessary to take these into consideration. I have selected this illustration because the results of such an accident as the fracture of a leg would appear to be of all things the simplest to diagnose. When we approach such ailments as nervous diseases we find ourselves literally wandering in a maze through which there is no path. It is commonly enough known, even by those who have not studied medicine, that while each disease shows certain symptoms common to each recurrence of it, each case must be treated separately and allowance made for many things peculiar to the patient.

Among these are his or her occupation in life, habits, food, constitution or stamina, previous ailments and, above all, heredity or those tendencies which have come from his parents. Dr. Oliver Wendell Holmes in "Elsie Venner" makes the old family physician refer to the knowledge he has gained, during many years of practice, of the hereditary constitution of his patients, and the doctor adds that no school of science, no medical education can give this knowledge to his young competitors. All this is true, wonderfully true, and it is the lack of just this knowledge of the past which makes some cases of disease so terribly puzzling and which makes each case individual in itself.—Cyrus Edson, M. D., in North American Review.

### The Steaming Process.

Two Detroit young ladies met at a dry goods counter and for a time blocked the channels of trade by an exchange of experiences.

"You are looking so transparent," said one. "Tell me, dearest, what have you been doing to yourself?"

"Steaming," answered dearest, with a self satisfied sigh. "It's tiresome and hot, but the end justifies the means. I don't use powder any more—the hot water has a better effect. I'm almost parboiled now. And you?"

"Do I look improved, dearest?"

"Oh, yes, yes. You are so spirituelle. Do you sit up all night?"

"No. I don't eat meat, and I pose. I just stare at nothing for hours and hours. That gives me the true Hindoistic expression of transcendentalism. Oh, dearest, it is so improving to look at nothing and think of nothing for a long time. It is like the Sphinx."

"Excuse me," answered dearest slantly. "If I went into such 'improvement,' the family would shut me up and feed me on bread and water. I steam my features on the sly as it is."

Then these souls in Muffi felt to buying dry goods like ordinary women who do not pose, neither do they steam.—Detroit Free Press.

### He Remembered the Pins.

Fritz had been ordered by his master to take four horses and a lorry—which is a sort of car much used by coal miners and others who have need of vehicles for the conveyance of very heavy articles—and fetch a steam boiler from a neighboring town. Just as he was about to start his master's wife called him in and said: "Fritz, here's three pence. I want you to bring me a packet of pins."

and please don't forget it."

"No, ma'am," said Fritz, and off he started.

Some hours later Fritz came back, drove up to the house, unharnessed the horses, stepped into the house and delivered the small parcel of pins to the lady.

"I say, Fritz," said his master, who was standing at the window, "what have you done with the boiler?"

"Boiler, sir?" answered Fritz. "Don't nervet, sir. I hope you won't be vexed, but I clean forgot it."—Harper's Young People.

### Methods of Some Authors.

In The Writer Dr. Erichsen of Detroit has an article on how authors write. Darwin, we are told, wrote on scraps of paper as he traveled around in his sulky. Chateaubriand required all the luxuries of the craft in the way of desk, pens, paper and ink when he wrote. Dr. George Eliot writes, she is reported, ordinarily he writes with great ease, but "sometimes the composition of a stirring chapter so mercilessly excites him that great beads of sweat appear upon his forehead and he is compelled to lay down his pen unable to write another line."

Some authors write at night, others in the morning, and all of those here mentioned, except the ladies, enjoy the stimulant afforded by tobacco. Anna Katharine Green finds her stimulant in her scrappbooks, while Kate Field stimulates herself with hot water.

### The Instincts of Birds.

It is certain that all creatures on the desert show remarkable intelligence, and how they acquire their information is decidedly a puzzle. Suppose, for example, alfalfa seed is sown. The place may not have a bird about the day before the seed is put in, but next day a cloud of them will descend upon the spot and faithfully eat every seed. They do their work thoroughly and with praiseworthy industry. Poisoned wheat will check the entire removal of the seed, but the sparrow is never deterred by death, though there are some who affirm a few dead sparrows will have a chastening influence upon the rest. The sparrows with whom I have had personal relations despise death.—Exchange.

### A Devout Celestial.

In one of the Sunday schools at Olympia is a little Chinese boy who takes great interest in all the proceedings. When impressed with the propriety of bringing a nickel to put in the contribution box, he promptly responded, but as he parted with it he asked, "What for?" The kind teacher replied, "It's for Jesus, my dear." The second Sunday the same question and the same answer. The third Sunday the same, but now the little Celestial's eyes opened with earnestness as he further asked, "Jesus allus bloke?" The reply of the teacher is not recorded.—Portland Oregonian.

### Reason For the Past Tense.

"It sees, however," said the distinguished foreigner as he concluded his story, "simply a matter of hearsay." "You mean 'hearsay,' of course, count?"

"Ah, but zis was told me some time ago!"—Exchange.

### Sweet Potato Flour.

A St. Louis woman has perfected a patent to cover the process of making "sweet potato flour." The processes are those peeling the potato and kiln drying the peel so that it will keep for any length of time as a food for live stock; of drying and grinding the potato into three distinct grades of flour, and also of slicing and drying it in the form of "Saratoga chips."—New York Telegram.

## "Only the Scars Remain,"

Says HENRY HUDSON, of the James Smith Woolen Machinery Co., Philadelphia, Pa., who certifies as follows:

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